the flight of butterflies whilst coupling (Ann. Soc. Ent. de France, 1837, p. 77.) showing that whilst the males of *Pontia Brassicæ*, &c., *Colias*, and *Polyommatus* support the females, it is the latter which support their partners in the genera *Thais*, *Thecla*, *Argynnis*, *Melitæa*, *Hipparchia*, and *Pieris*." Now this is strictly analogous to these exceptional birds, because, among our British representatives of these genera whenever a considerable sexual difference of colour occurs, *the female is always the more brilliantly coloured*. Thus, the female *Thecla Quercus* has the bright purple patch, and the female *Thecla Betulæ* the brilliant orange blotch on the fore wing, while the females of *Hipparchia* (*Satyrus*), *Janira*, and *H. Semele* are considerably brighter than their partners. The female *H. Megæra* is rather brighter than the male, and the same is true of *Colias Edusa* and *C. Hyale*, since the females of these species have orange or yellow spots in the black marginal border, represented in the males by thin streaks only. The females of the whole genus *Pieris* also are ornamented with black spots on the fore wings, which are only partially present in the males. I must confess that I am not convinced of the action of sexual selection in producing the colours of insects, but it cannot be denied that these facts are strikingly corroborative of Mr. Darwin's views. With few exceptions the rule holds good throughout the exotic species of these genera.

R. MELDOLA

The Irish Fern in Cornwall

OWING to an accident I did not see NATURE for the 23rd of February till yesterday. In a note which appears in it, on the report of the Cheltenham College Natural History Society, a doubt is expressed as to the accuracy of the statement that the fern, *Trichomanes radicans*, has been found in Cornwall. Knowing that it had not yet been recorded from that county, I have, for some years past, intended to take an early opportunity to make the following facts public; time has, however slipped away, and I have never yet done it.

In August of the year 1867, at St. Knighton's Kieve, a romantic ravine and waterfall on the northern coast of Cornwall, about two miles from Tintagel Castle, I obtained an undoubted specimen of this fern. It grew on a rock overhanging the water, about a quarter of a mile below the fall. It was an exceedingly small patch, and I accordingly contented myself with a small root bearing two fronds. Wishing to grow this specimen instead of drying it, and having unfortunately placed it in a hot-house, the plant died. I have, however, preserved it, withered and dried up as it is, and when I return to London, where my herbarium is, I shall be glad to produce it for the satisfaction of any sceptics. In the following year (1868) I paid an exceedingly hurried visit to the same spot, but failed to find the fern; never having been in the neighbourhood since, I have been unable to confirm or to dispel my fear that the plant has been discovered by some ruthless collector. I may add that I have long since mentioned this fact to various friends interested in Botany.

Morebattle, Kelso, April 6 EVERARD F. IM THURN

Fertilisaton of Hazel

IN a recent number of NATURE Mr. Bennett makes some remarks on the above. What he says leads to the belief that the male flowers of any one plant discharge their pollen just at the very time the stigmas of the female flowers of the same plant are receptive. My observations made this spring, and extending over a number of specimens, quite agree with those of Mr. Marcus Hartog, and therefore break through Mr. Bennett's law, and show that although the hazel is apparently monœcious, yet, practically, it is diœcious. On one plant which I pointed out to several gentlemen, the fertile flowers had their pretty red styles protruded beyond the scales and the receptive stigmas long before a grain of pollen was discharged from the adjoining catkins, whilst on another plant a hundred yards distant from the first all the barren flowers were withered up and ready to fall before the females could be seen.

Lexington, Kentucky JOHN DUNCAN

Thunderstorm at Preston

ON the 25th of last month a violent thunderstorm occurred at Preston, in Lancashire. The spire of St. Walburge's Church, which is, perhaps, the highest point in the town, was struck by lightning, some curious phenomena resulting. The lightning conductor, a rope composed of forty-two copper wires in six strands, was ruptured at about sixty feet from the ground. The wires were untwisted and spread out, the ends fused, and some of them turned up like hooks. The discharge passed obliquely through the tower wall for a distance of about three yards to a gas-pipe inside. In its passage it wrenched a piece of stone weighing 66lb. from an immense block, casting it to a distance of a hundred feet, besides literally tearing off other large masses. Before reaching the gas-pipe it projected some bricks against the opposite interior wall, shattering them to pieces. The gaspipe was severed and the lower portion curled completely round. Thence it passed to the gas-meter and dislocated many pipes beyond. The effect upon one leaden pipe was singular, holes were fused into it, in some cases right through, the molten metal being scattered about. Another discharge passed down a conductor at the west end of the church. The conductor itself was not ruptured, but a gas-pipe close to it was broken and a piece about a yard long was projected to a distance of forty feet, the gas meanwhile having ignited. Within the church, too, where there happened to be a leakage, the gas also ignited. It was further observed next morning that round about the church hundreds upon hundreds of worms were dead or dying.

Stonyhurst College STEPHEN WILLIAMS

Meteorology in Asia

IN NATURE, vol. iii. p. 473, it is said, "from Asia Minor we get no scientific records of weather." Perhaps you will pardon my informing your readers that the Turkish Government has eight telegraphic meteorological stations, besides its Central Observatory at Constantinople, under M. Aristide Coumbary. The stations are Sulina, Varna, Salonika, Fao, Bagdad, Smyrna, and Beyrout.

Two of these are in Asia Minor, and Beyrout is not far off. The observations are published monthly. In addition Mr. E. Purser, C.E., of the Smyrna and Aidin Railway Company, has published his observations for several years.

ROBERT H. SCOTT

A Wind Direction Rain Gauge

REFERRING to the paragraph in your number of March 30, p. 433, and Mr. Lyall's letter, April 6, p. 488, on Mr. Napier's "Wind Direction Rain Gauge," I beg to say that a gauge of a similar construction is in use at the Meteorological Observatory, Army Medical Department, Aldershot Camp. It was devised by the observer, Mr. John Arnold, A.H.C., F.M.S., about three years ago, so it would appear that the credit of the invention, if I may so term it, is due to no less than three parties, to each of whom I believe the matter was entirely original.

JOHN JAMES HALL, F.M.S.

Meteorological Observatory, Fulwell, near Twickenham, April 20

Spectra of Aurora, Corona, and Zodiacal Light

WHILE I am glad on my part to see Mr. Henry R. Procter's letter on the spectra of terrestrial aurora and solar corona in NATURE, p. 468, he may not be displeased on his to receive a confirmatory statement from an independent observer; and to this effect, viz., that whereas, firstly, the spectra of nineteen out of twenty auroras this winter have practically shown me nothing but one bright green line, and secondly, the spectrum of the solar corona, as seen during total eclipses, is said to be mainly characterised also by a similarly single vivid green line, yet it is not the same green line in the two cases, but a something widely, absolutely, physically, different.

I shall be glad, however, to be allowed still further on a branch of this subject, to ask, through the medium of NATURE'S useful columns, whether anyone can kindly supply me with recent observations of the spectrum of the zodiacal light?

I have been trying for it in vain all this spring-time, and have now in despair given it up for the season. M. Angström—to whom be all honour for his first observation and correct description of the ordinary auroral spectrum—says that the zodiacal light spectrum shows the same green line as the aurora, viz., 1249 (Kirchhoff); but the eclipse observers, after proving that

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the corona is cosmical, solar, and the denser part of the zodiacal light,* might expect the latter rather to show the corona's green line, viz., 1474 (Kirchhoff).

This, however, the zodiacal light, according to M. Angström, does not. Is the zodiacal light then telluric and auroral, not solar and coronal? The measurement of the *place* of its green line should settle at once this most important and extensive physical question; and if the line be at any time visible at all, the large spectral distance between 1249 and 1474 (Kirchhoff's scale) would be sensible in the simplest apparatus. Yet, in these high latitudes the zodiacal light is always so extremely faint, so frequently altogether masked by auroral glows, and as yet, for its spectrum, depending, so far as I know, on only one observer, and he residing in quite an aurora-ridden part of the world, that it would seem to be a perfectly fair question to ask, "if any one else, besides the distinguished Natural Philosopher at Upsala, has observed the spectrum of the zodiacal light; and if so, how and where?"

C. PIAZZI SMYTH

Royal Terrace, Edinburgh, April 14

* [We venture to doubt this.—ED.]

Aurora by Daylight

I SEE that more than one of your correspondents in December numbers dispute the possibility of an aurora being seen by daylight. It doubtless is a rare occurrence, but two cases of the kind have come under my notice.

In December last my son saw what he took to be an aurora a little before sunset. He was at the time about three miles from home, and he had it constantly before him during his walk homewards, and saw it more and more developed as the darkness increased, so that there can be no doubt of the appearance before sunset being identical with what proved to be, as the night advanced, one of the most brilliant displays which we have had during a year very prolific in auroras. He states that after the sun had set, but whilst it was still quite light, the bright rose colour which distinguished that aurora was distinctly visible. The streamers that night proceeded from all parts of the heavens, meeting almost in the zenith, but what is very unusual, they were very much brighter in the east and south-east than in any other direction, which is probably the reason why they were so clearly visible whilst the sun was in the opposite quarter.

The other case came under my own observation in September 1849. Immediately after the sun had set, with a perfectly clear sky, I noticed three slightly diverging beams of light on the western horizon. One might almost have taken them for those beams from a setting sun which one sees much more often in pictures than in nature, had it not been that they did not emanate exactly from the spot where the sun had set, that they had an evident motion to the southward, and that two of them extended to the zenith, and finally down to the eastern horizon. It proved to be the most symmetrical auroral arch I ever saw. The perfect horizon I had to the west, and the straightness of its well-defined edges, joined to the facility which the double arch afforded of measuring the distance between the middle of each, immediately struck me as affording an opportunity of calculating its elevation above the earth, upon the supposition that the tapering away towards the horizon was the effect of perspective alone. I took steps therefore to measure the apparent width in the horizon and overhead, and also its rate of motion to the southward in both places, and by both methods the result was about 8 to 1. From these data, upon the assumption that it was a double ring everywhere equidistant from the earth's surface, and moving parallel to itself, I calculated the elevation, which came out 97 miles, and its rate of motion to the southward 656 miles per hour, the auroral meridian being N. 13° 15′ E., and the inclination of the plane of the arch to my horizon 94° 55′. These figures, whatever reliance can be placed on them, have nothing to do with the present question further than to show how bright the object must have been thus to attract my attention, and that, although the sun had set, there was still daylight enough for me to see the second hand of my watch, and to note the objects on an horizon some three or four miles distant, by which I measured the progress of the base of the arch, and the bearings of which I took the next day. Before it became really dark, the arch had become irregular, and detached streamers showed themselves in the usual form.

Ottawa JOHN LANGTON

UNIVERSITY INTELLIGENCE

OXFORD

QUEEN'S COLLEGE.—Mr. Charles Thomas Blanchard of Clifton College, was elected to a Scholarship in Natural Science in this College on Saturday last. *Proxime accessit*—Mr. William Percy Ashe, of Magdalene College School.

CORPUS CHRISTI COLLEGE.—There will be an Election to a Natural Science Fellowship in this College at the beginning of next Michaelmas Term. The examination will be specially in Chemistry, and will commence on Monday, Oct. 9 Candidates must have passed all the examinations required by the University for the degree of B A., and must not be in possession of any benefice or property which would disqualify for retaining a Fellowship. Candidates are requested to communicate with the President, either personally or by letter, at their convenience, before the end of Act Term.

Natural Science Lectures

The following Lectures will be given in addition to those noticed in our number for last week :—

Chemistry. Mr. Wyndham on the Elements of the Nitrogen, Boron, and Carbon groups, and their Combinations, on Thursdays and Saturdays at 11 A.M., at the University Museum.

Physiology. On General Physiology, with special reference to the microscopical anatomy and physiological chemistry of the elementary tissues. By Mr. Chapman. Mondays, Wednesdays, and Fridays, at 10 A.M, at the Magdalen College Laboratory.

Physics. On Elementary Mechanics and Hydrostatics. By Mr. Abbay. These lectures are free by mutual arrangement to members of these colleges at which either of these gentlemen is a lecturer, viz, to members of Merton, Magdalen, Jesus, and Wadham Colleges.

CAMBRIDGE

The following lectures in Natural Sciences are to be delivered at Trinity, St. John's, and Sidney Sussex Colleges during Easter term, 1871 :—

On Heat. (For the Natural Sciences Tripos.) By Mr. Trotter, Trinity College, Monday, Wednesday, Friday, at 10, commencing Friday, April 28.

On Electricity and Heat. (For the Special Examination of the B.A. Degree.) By Mr. Trotter, Trinity College, Tuesday, Thursday, Saturday, at 10, commencing Tuesday, April 25. Students of Colleges other than Trinity, St. John's and Sidney, can be admitted on payment of a fee.

On Chemistry. By Mr. Main, St. John's College. Tuesday, Thursday, Saturday, at 12, commencing Thursday, April 27. Attendance on these lectures is recognised by the University for the certificate required by medical students previous to admission for the first examination for the Degree of M.B.

Instruction in Practical Chemistry will also be given.

On Geology. By Mr. Bonney, St. John's College.

1. Palæontology. Wednesdays and Fridays, at 9, commencing Friday, April 28.

2. Lyell's Principles of Geology. Tuesdays and Thursdays, at 9, commencing Thursday, April 27.

3. Elementary Lectures. Tuesdays and Thursdays, at 11, commencing Thursday, April 27. Students of other Colleges can be admitted to these lectures on payment of a fee.

On Botany (chiefly systematic and physiological.) By Mr. J. W. Hicks, Sidney College. Tuesday, Friday, Saturday, at 12, beginning Friday, April 28.

On Physiology. The Trinity Prælector in Physiology (Dr. M. Foster) will probably give a short course on Embryology at the New Museums, of which notice will be given.

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